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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/785,458      | 02/20/2001  | Susumu Hashimoto     | 016907/0935         | 9555             |

7590

04/02/2002

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EXAMINER

MILLER, BRIAN E

ART UNIT

PAPER NUMBER

2652

DATE MAILED: 04/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/785,458

Applicant(s)

HASHIMOTO ET AL.

Examiner

Brian E. Miller

Art Unit

2652

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20,22,23,26-29,38-40 and 43-55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 is/are allowed.
- 6) ☒ Claim(s) 11-20,22,23,26-29,38-40 and 43-55 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/204,676.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2652

This is a Continuation of Reissue application 09/146,222 and claims 1-20, 22-23, 26-29, 38-40 and 43-55 are now pending.

***Reissue Applications***

1. Applicant is reminded of the continuing obligation under 37 CFR 1.56 to timely apprise the Office of any litigation information, or other prior or concurrent proceeding, involving Patent No. 5,552,949, which is material to patentability of the claims under consideration in this reissue application. This obligation rests with each individual associated with the filing and prosecution of this application for reissue. See MPEP §§ 1404, 1442.01 and 1442.04.
2. The original patent, or an affidavit or declaration as to loss or inaccessibility of the original patent, must be received before this reissue application can be allowed. See 37 CFR 1.178.
3. It is reminded that in accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

An example of acceptable language to be used in the supplemental oath/declaration is as follows:

“Every error in the patent which was corrected in the present reissue application, and is not covered by a prior oath/declaration submitted in this application, arose without any deceptive intention on the part of the applicant.”

### *Claim Objections*

4. Claims 38, 55 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. "A magnetic head comprising a magnetoresistance effect element as set forth in claim ?" does not further limit the magnetoresistance effect element recited in the independent claim.

### *Specification*

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the language in claim 27 that "the antiferromagnetic layer has less than a 10% probability for occurrence of corrosive pits" is not found in the specification.

It is noted that any change in the specification must be presented as an entire paragraph and all subject matter being added to the patent must be underlined.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2652

7. Claims 11-20, 22, 23, 26-29 and 38-40, 43-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dieny et al (US 5,159,513) in view of Lin et al (US 5,315,468).

With respect to claims 11-14, 17, 22 and 38, Dieny et al shows in FIG. 2 a magnetoresistance effect element including a spin valve having a first ferromagnetic layer 16; second ferromagnetic layer 12; a nonmagnetic spacer layer 14 in between the two ferromagnetic layers; and an antiferromagnetic layer 18. Dieny et al does not show the antiferromagnetic layer being formed of PtMn. Lin et al, however, teaches (col. 8, lines 5-12) an antiferromagnetic layer formed of PtMn for exchange biasing a ferromagnetic layer. The Mn is specified as being in the range of 33-60 atomic %. Lin et al also teaches (col. 8, line 9) the use of PdMn as the antiferromagnetic layer. From these teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the spin valve of Dieny et al with an antiferromagnetic layer formed of PtMn or PdMn as taught by Lin et al in lieu of NiMn as taught by Dieny et al. The motivation would have been: substituting PtMn or PdMn for NiMn would have been realized by a skilled artisan, since PtMn and PdMn have Neel and blocking temperatures similar to NiMn and have improved corrosive resistance over NiMn (see col. 2, lines 13-36 and col. 8, lines 14-18).

With regard to claims 15 and 20, Lin et al further teaches (col. 8, lines 14-18) adding Pt or Cr to Ni-Mn films for improved corrosion characteristics. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the spin valve of Dieny et al with an antiferromagnetic layer formed of PtMnCr or NiMnPt as taught by Lin et al. The motivation would have been: improved corrosion characteristics would have provided longevity to the MR structure.

Art Unit: 2652

With regard to claims 16 and 23, Dieny et al in view of Lin et al is silent as to the claimed amounts of Pt and Ni. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the claimed amounts of Pt and Ni through routine engineering optimization and experimentation, lacking any unobvious or unexpected results, as would have been realized by a skilled artisan.

With regard to claims 26-29, the antiferromagnetic film is substantially free of corrosive pits “when” it is exposed to an atmosphere having relative humidity of 90%, at a temperature of 90 degrees centigrade for a time duration of 48 hours, since it would be the same material, so it would obtain the same results when subjected to this process.

With regard to claim 43 and the recitation of the first ferromagnetic layer consists essentially of CoFe, although Dieny et al suggests the ferromagnetic layer 16 is a Co or Co alloy (CoMoNb or NiFeCo), is silent as to the alloy being CoFe, however, Official Notice is taken that CoFe is a known ferromagnetic film and it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized CoFe as the ferromagnetic layer of Dieny et al. The motivation would have been: lacking any unobvious or unexpected results, the use of CoFe for the ferromagnetic layer would have resulted through routine engineering experimentation. CoFe has known magnetic characteristics which would be favorable for use in a magnetoresistance effect element, i.e., a highly stabilized magnetic domain, good permeability and near zero magnetostriction. Further, it has been held to be within the knowledge of a skilled artisan to select a known material on the basis of its suitability for the intended use; see *In re Leshin*, 125 USPQ 416 (CCPA 1960).

*Allowable Subject Matter*

8. Claims 1-10 are allowable over the prior art of record.
9. If applicant would change the word "when" to --wherein-- in claim 26 to positively set forth the process, the claim would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Since claims 27-29 depend from claim 26, those too would be indicated as allowable.

*Response to Amendment*

10. Applicant's arguments filed 12/28/01 have been fully considered but they are not persuasive.
11. A...Applicant asserts that the invention which employs a spin valve sensor using a PtMn alloy as the antiferromagnetic layer "provides an unexpected result which rebuts any prima facie case of obviousness that is allegedly established in the Office Action."  
  
In response, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The Examiner has set for<sup>rk</sup> an *expected* result from the use of PtMn (or PdMn) as the antiferromagnetic layer material as taught by Lin et al, i.e., since PtMn and PdMn have Neel and blocking temperatures similar to NiMn and have improved corrosive resistance over NiMn (see col. 2, lines 13-36 and col. 8, lines 14-18). This result alone would have provided enough motivation to a skilled artisan to have used the PtMn (or PdMn) antiferromagnetic layer in the device of Dieny et al.

Art Unit: 2652

**B...** The examiner has reconsidered applicants' "Exhibit 1" and "Exhibit 2", however, neither is considered persuasive.

**C...** Applicants assert that Dieny et al in view <sup>of</sup> Lin et al does not teach nor suggest that the "first ferromagnetic layer consists essentially of FeCo.

Although noted that Dieny does include NiFeCo and other Co alloys, according to applicant, a ferromagnetic layer consisting essentially of FeCo would not be encompassed by the applied references.

While this may be argued by the Examiner, the examiner takes Official Notice that this known material would have been readily chosen by a skilled artisan for use in an MR element. See the newly cited references.

**D...** It is noted that if applicant positively recites the "process" limitation in claims 26-29, those claims would be favorably considered (see paragraph 9, supra).

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure including US Patents to Liao et al (4,756,816) and Iwasaki et al (5,702,832) which are cited to show the use of CoFe as a ferromagnetic layer.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



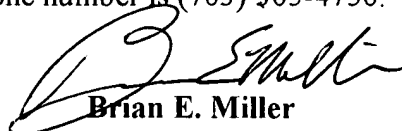
Art Unit: 2652

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian E. Miller whose telephone number is (703) 308-2850. The examiner can normally be reached on M-F 8am-5:30pm (FF off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

  
**Brian E. Miller**  
**Primary Examiner**  
**Art Unit 2652**

bem  
March 22, 2002